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Published in:
Kultur und Informatik

Publication date:
2018

Document Version
Accepted author manuscript, peer reviewed version

Link to publication from Aalborg University

Citation for published version (APA):
Stok, N. A. B., Formackova, D., Pedersen, E. H., & Rodil, K. (2018). The Jackal and the Wolf: Adapting a Namibian Cautionary Tale Into a Virtual Reality Game. In *Kultur und Informatik : Hybrid Systems* Verlag Werner Hülsbusch. https://www.interdisciplinary-laboratory.hu-berlin.de/en/content/kultur-und-informatik-hybrid-systems/

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The Jackal and the Wolf: Adapting a Namibian Cautionary Tale Into a Virtual Reality Game

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Abstract

Many indigenous traditional ways of living are disappearing due to globalisation and widespread rural-urban migration. Younger generations are losing interest in their own cultural heritage, as they often grow up in countries with an Anglo-American culture view. This has led to the need of not only safeguarding but also making the cultural heritage available and interesting to these new generations. New ways of digitising are becoming available due to advances in technology, which can be useful for safeguarding and dissemination intangible cultural heritage. But in the meantime, these technologies are constructed on the very basis of the Anglo-American view. This project uses the tripartite digitisation model to explain the process of adopting a Namibian cautionary tale into a virtual reality game and reflects on the whole process and the uncovered challenges in translating captured in situ unimodal audio data for an ex situ VR dissemination approach.

1 Introduction

In recent years, intangible cultural heritage (ICH) has received a lot of attention mainly thanks to the 2003 Paris meeting organised by UNESCO, where it was mentioned as “a mainspring of cultural diversity and a guarantee of sustainable development”. This project adopts the definition of ICH as presented by UNESCO [UNESCO2003] consisting of five domains:

A. Oral traditions and expressions, including language as a vehicle of the intangible cultural heritage.
B. Performing arts.
C. Social practices, rituals and festive events.
D. Knowledge and practices concerning nature and the universe.
E. Traditional craftsmanship.

These domains are not exclusive, meaning that an instance of ICH can very well cover multiple domains. Therefore, the domains are seen more as a framework for identifying ICH and not a discrete way of categorising it. As stated by UNESCO, the boundaries between the domains are also fluid and varying, meaning that what one community might consider a song, another community might consider a ritual.

ICH is among indigenous populations transmitted orally and transferred among individuals and communities by engaging in shared practices. The richness of human culture is not only of sentimental value as it provides valuable knowledge (for instance surrounding farming) and a sense of identity and continuity to the people where these practices are performed [Convention2003]. Because of widespread rural-urban migration and globalized schooling systems (among many other factors) the ICH of many indigenous populations across the globe is in danger of disappearing [Ott2015, Convention2003]. Often, young people are less interested in their own cultural heritage as they grow up or spend many years in big cities with a manifested Anglo-American culture view [Byamugisha2014]. This means that not only does the indigenous culture need to be preserved for future uptake, but it also has to be appealing to new generations of technology savvy youths.

The scope of this paper covers preservation of ICH, specifically within domain A, through digitisation. The paper also discusses the possibilities and challenges of converting from one modality to multiple.

2 Preserving ICH with technology

2.1 Digitising ICH

ICH as a research field has primarily been approached with methods originating from more qualitative disciplines. For instance by observations and detailed written descriptions of practices. With the advancement of information and communications technology (ICT) new avenues continuously open up for reconsidering how safeguarding of ICH can be carried out. Embedded in these apparoaches is an unavoidable ethical challenge, which essentially boils down to: what happens with captured ICH when turned to bits and bytes?

The process of digitising ICH could be represented as a three-step process, as suggested by Rodil and Rehm [Rodil&Rehm2015]. The Tripartite Digitisation Model (TDM) illustrates the approach of capturing, representing and disseminating data within the technological field. In the following sections we provide a short rundown of the TDM.

2.1.1 Capture

When digitising ICH it is important to consider the method for capturing data and the type of data the method produces. ICH is highly contextual and it is therefore challenging to safeguard, as any captured data (written texts, audio/video recordings) only presents one specific aspect of the ICH. It is therefore important to consider what type of data a given method will produce and in that connection what type(s) of data is needed for the intended representation and dissemination. An example of how a capture method can vary greatly from the classic capture methods e.g. observing and note taking, can be seen in the paper written by Protopapadakis et. al. [Protopapadakis2017] where a Kinect sensor was used to capture information of several body joints during multiple greek traditional dances. In this way technology enhances the understanding of the ICH and affords further representation and dissemination.

2.1.2 Representation

The captured data can be represented in a multitude of ways depending on its intended use. If the goal is to archive the data, then the data needs to be structured in a way, so that it is easy to find and retrieve information from or in combination with other data sources. Such examples might include searchable databases and inventories like the website created for the "eNanda Online" project [Marschall2014], where the indigenous community can upload e.g. videos and audio recordings. In this case the representation is the storing of video, audio and texts created by the Zulu community outside Durban.

On the other hand, data can also be represented in a format or media which can then be used in an interactive system depending on the goal of dissemination. This however requires the data to be analysed in depth, in order to correctly portray the concepts and relations between them.

2.1.3 Dissemination

Dissemination means bringing the captured data to the audience. The way of disseminating the data could be accomplished using three different strategies:

- Static - a passive system with no required user input, e.g. a text or a video recording
- Dynamic - a system that allow the user to search and combine sources, e.g. a browse-able web archive.
- Interactive - a system that allow the user to experience ICH, e.g. an educational VR game.

From this point it becomes clear that the presented strategies are dependent on the data type(s) and the representation created from said data.

As this model is a three-step process, each step is dependent on the previous ones in such a way that more possibilities might emerge or become limited. For example the type of captured data has an impact on how the data can be represented for the chosen dissemination method. An example of disseminating ICH is the game Honour Water by Pinnguaq. Honour Water is an Anishinaabe singing game, made in an attempt to disseminate “water songs” and spread awareness of threats to the water [LaPensée2016].

2.2 Interactive systems and ICH

Several researchers suggest the usage of ICT as tools for both preservation and dissemination [Styliaras2010, Solanilla2008, Ioannides2017, Mendoza2009]. As mentioned by Bendicho et al. "3D technology (either virtual reality, augmented reality or mixed reality) helps us in the representation and interpretation of reality, (...) especially cultural heritage and archaeology." [Ioannides2017] Generally, interaction in virtual reality (VR) or in a 3D world is often desired as the lack of interaction fails to catch the attention of the public [Pietroni2013, Turner2007].

Interactive experiences for disseminating ICH are generally considered a good way for generating interest for younger generations [Ioannides2017], yet the actual research into this area is scarce. An example of such effort is an adventure game made by Zaman et al. [Zaman2015], which is used as a tool for teaching a specific sign language from Malaysian Borney. In their paper it is described how the team used several methods of capturing data in the original context i.e. an Oroo' expert creating different signs in the rainforest. This was done for the exact purpose of representing and disseminating the knowledge and practises of the Oroo' sign language through a computer game.

Looking at ways of digitising orally-transmitted stories through interactive experiences, the research is even more scarce. Ladeira and Blake [Ladeira2004] created an interactive virtual experience in which the users can listen to a story as opposed to reading it. The user can move freely in a virtual cave, interact with objects and investigate cave paintings, while listening to a virtual avatar re-telling the story.

From surveying the field of virtual reality and cultural heritage, only examples of tangible cultural heritage could be found, which leaves the area of using VR as a tool for disseminating unexplored in many of the ICH domains.

3 From sound to a multisensory experience of ICH

In the following sections, the process of adapting a cautionary tale from Namibia into a VR game is presented and reflected upon through the lens of TDM.

3.1 Capture - The Jackal and The Wolf

Through collaboration with "Namibia University of Science and Technology (NUST)" a cautionary tale was recorded in English and provided to the design team.

The story is primarily about a hungry jackal and a hungry wolf entering a garden through a hole in order to eat fruits. The jackal eats until it is full and then leaves the garden, while the

wolf keeps eating until it becomes very full, gets stuck in the fence and is caught by the farmer. The underlying message of this story is greediness.

3.2 Representation - The Jackal and The Wolf

While VR offers a multisensory experience, the captured data type is only one modality, namely audio which contains no imagery making it necessary for the design team to create 3D-graphical representation based on personal imagination and knowledge.

Many of the 3D-graphical representations created for this VR game were made with the use of a multitude of individual reference pictures, in which various object accessible to the Namibian rural community were depicted. The resulting collection of graphical assets for the game was imagined to represent the storyworld.

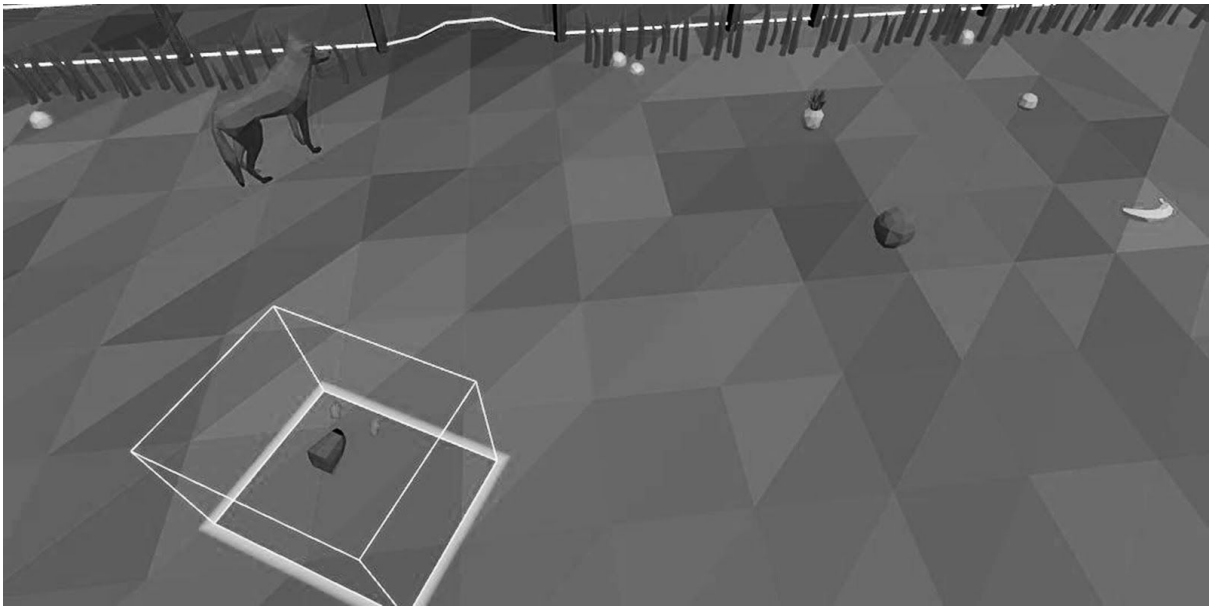

Figure 1. Top down view of game scene. The illuminated box represents the player, who plays as the Jackal.

The original audio file is only around one minute long and did not contain enough content to fit with a full blown game. Thus on a conceptual level, all missing information from the data becomes an interpretative process – subjected to the mental models of people responsible to use this information in a digitisation effort.

3.3 Dissemination - The Jackal and The Wolf

3.3.1 Description of the game

The game was developed using the Unity Game Engine and Microsoft Visual Studio.
As the game is played using the HTC Vive head-mounted display (HMD), the Virtual Reality Tool Kit also known as VRTK created by Harvey Ball [Vrtk] was used to implement most of the VR functionality of the game in a fast and reliable manner.

HTC's tracking system offers new possibilities for in-game interaction, and especially new ways of moving around the virtual space had to be considered. With help from the VRTK a walk in place movement was implemented. This system allows the user to swing the controllers back and forth to create the sensation of walking in a forward direction based on the rotation of the HMD.

The user takes on the role of the jackal in the story and one of the main events is to eat fruit. The mechanic of eating fruit in the game functions by having the user touch the fruit with their virtual snout. By having the position of the virtual snout be dependent on the position of the HMD, the user is required to lean forwards when eating fruits.

The captured story was adapted in a way that the user plays as the jackal and the objective is to obtain a certain amount of points by eating fruit and then leaving the garden. The amount of points obtained is not directly presented to the user, but is rather presented through descriptive narration e.g. eating one fruit is described as more filling than another. The user can get an estimate of the total amount of points by approaching the exit of the play area, which is represented as a hole underneath the fence. This mechanic is a direct adaptation from the story, in which the jackal repeatedly checks whether it can fit the hole. The user can win the game by eating enough fruits and escaping the garden before the wolf blocks the hole.

3.3.2 Testing dissemination capabilities

Preliminary testing was conducted with a group of 20 participants. The testing was focused on the narrative intelligibility i.e. how well the intended meaning is communicated to the audience. The test was based on the work by Ladeira and Blake [Ladeira2004] and it was found that over half of the participants understood the underlying message. Furthermore, the

testing included two additional questionnaires: a usability test and a standardised simulator sickness questionnaire (SSQ) developed by Kennedy et al. [Kennedy1993]. The usability test was inspired by a standardized usability test by Sutcliffe and Kaur and contains questions regarding specific game mechanics used in the system and the overall objective of the game [Sutcliffe2000]. None of the participant experienced any severe discomfort while using the system and the overall enjoyment of the game was high. However, the objective of the game could be communicated more clearly in order to potentially increase the narrative intelligibility.

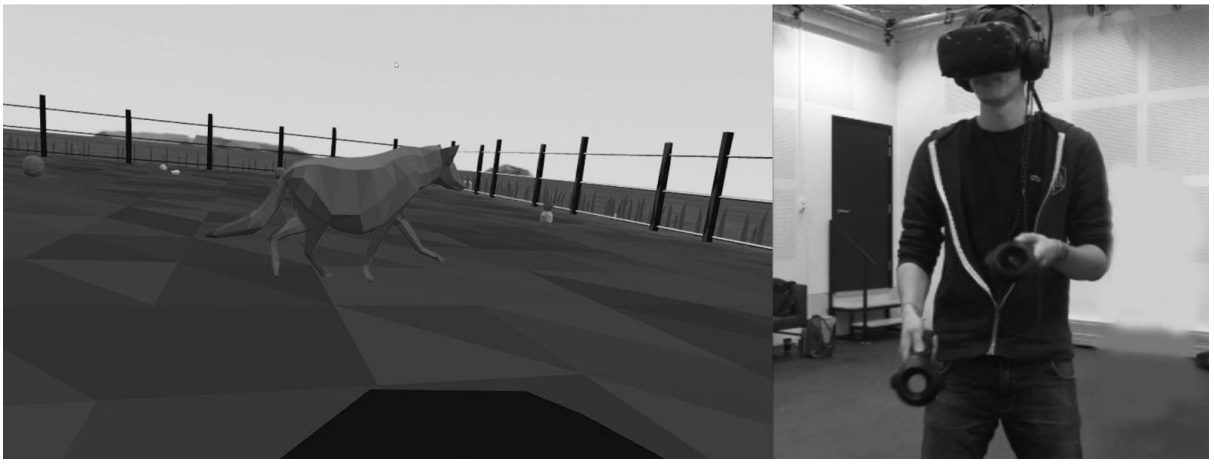

Figure 2. Screen capture and photograph of one of the participants testing the game.

4 Discussion

Testing an application for story comprehension does not take away the underlying problem of filling in the blanks for data not being captured in the digitisation process. While this case is extreme (one modality to a multisensory experience), it enables us to reflect on the many shortcomings of digitising ICH.

Orally-transmitted stories are dynamic in nature when performed within an indigenous community. This means the way the story is told is ever-changing dependent on several factors, e.g. the mood of the storyteller or how the storyteller adapts to the audience. Once a story is recorded it becomes static, which means it become an uncontested ’snapshot’. It is therefore important to realize that the safeguarded material will represent how the story was

told at that point in time and by one specific storyteller. Hence, the words used to tell the story orally might be different in the future or simply when told by another person but the underlying message will presumably remain the same as it is in the static representation.

Besides the point of creating a static representation of a dynamic story, the storyteller's understanding of specific words might differ from the designer's. This could in turn affect the decisions made when creating 3D-graphical representations, e.g. the word "garden" was used for the setting of the story. The designer's mental image tied to this word might result in a 3D-graphical representation that does not resemble the mental image of the storyteller – and plausibly missing an underlying point essential for the story.

This representation in itself is not the only thing to consider. In the object-oriented mindset of people who were born and raised in a Westernized society, it is possible to use a graphical visualisation alone to represent a perceived reality. However, the underlying way of understanding and seeing the world from where the ICH is meaningful might most possibly reflect other ways of thinking. In this sense creating an accurate visual representation of individual objects might not be as important as the spatial and temporal relations between them, as evident from much of the research conducted by Rodil and colleagues [Rodil2015, Rodil2011].

Although this project utilises 3D-graphical representations to immerse the user in the story, the representations alone could merely be seen as a vehicle for conveying the story and the underlying message to the audience and not as an essential part of the ICH. Collaboration with the indigenous community plays a key part in this step of the digitisation, as it is only the members of this community that can decide what they consider a part of their cultural heritage and which elements are contradictory.

When digitising ICH belonging to domain A, considerations concerning the methods for capturing data seems just as imperative as the representation of the data – and ultimately the dissemination. All of these stages must be considered on an equal footing. The reason being that, for one community the mental images created during the storytelling might be crucial, whereas for another community (e.g. a Danish high school class) the understanding of the

message might be deemed the only important aspect. If the former is the case, then creating 3D-graphical representations of story elements like characters, will require more from the capture phase, e.g. drawings made by the community. Because the visual imagery created for VR might be placed by outsiders. Traditionally and before widespread migration – these mental models were produced within the community space. The latter case, however, will need no more than an audio recording or a written text, as any graphical representations can be seen as a tool for communicating the story. In either case the collaboration with the indigenous community is key, both in order to live up to the ethical principles for safeguarding as presented by UNESCO [UNESCOethics] and to ensure each step in digitising is optimal for the given content and use case.

As there is currently no applicable method for correctly designing and assessing narrative intelligibility, it is speculated that the amount of participants comprehending the underlying message could be greater once a better way of assessing this is devised. Besides narrative intelligibility, future research and attempts at digitising ICH belonging to domain A, should take steps to assess the learning of the intended message i.e. if it is stored in the long term memory. Without investigating this aspect, the idea of learning a lesson from a cautionary tale, the process of dissemination could be considered incomplete.

5 Conclusion

Through the case study it was found that a digital representation of a cautionary tale in the form of a VR game is able to communicate the story on its most basic level i.e. the underlying message. But actively working with captured ICH material in a very limited form requires technology designers to fill in the blanks of what the data does not offer – hereby limited to inform the technological application from a highly subjective perspective. A perspective that in many cases is not one that matches the viewpoints of the community from where the data originates. This process of digitisation has made it clear that to have any respectful representation and dissemination in VR based on an audio recording requires partnership with de facto ICH owners to assist in correcting biased cultural perspectives. Whether it is possible to construct *truthful* multisensory ICH VR experiences from unimodal data for younger generations remains speculative.

Acknowledgements

The authors would like to thank Namibia University of Science and Technology for their collaboration and providing content that made this project possible. We would also like to thank Peter Kejser Jensen for his contribution in the first stage of the project.

References

[Byamugisha2014] Byamugisha, J., Sitbon, L., & Brereton, M. Cultural and Linguistic Localization of Games to Bridge the Digital and Cultural Divide in Indigenous Populations. In Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: The Future of Design (pp. 484–487). New York, NY, USA: ACM, 2014.

[Convention2003] Convention for the Safeguarding of the Intangible Cultural Heritage. (2003). Retrieved October 6, 2017, from http://portal.unesco.org/en/ev.phpURL_ID=17716&URL_DO=DO_TOPIC&URL_SECTION=201.html

[Ioannides2017] Ioannides, M., Magnenat-Thalmann, N., & Papagiannakis, G. Mixed Reality and Gamification for Cultural Heritage. Springer, 2017.

[Kennedy1993] R. S. Kennedy, N. E. Lane, K. S. Berbaum, and M. G. Lilienthal. Simulator sickness questionnaire: An enhanced method for quantifying simulator sickness. The international journal of aviation psychology, 3(3):203–220, 1993.

[Ladeira2004] I. Ladeira and E. H. Blake. Virtual San Storytelling for Children: Content vs. Experience. In Proceedings of the 5th International Conference on Virtual Reality, Archaeology and Intelligent Cultural Heritage, VAST'04, pages 223–231, Aire-la-Ville, Switzerland, Switzerland, 2004. Eurographics Association.

[LaPensée2016] LaPensée, E., and Moulder, V. Walking and wiring the land: Indigenous art practice in games. interactions 24, 1 (2016), 46–49.

[Marschall2014] S. Marschall. eNanda Online: sharing Zulu cultural heritage on the Internet. Published in: International Journal of Intangible Heritage, 2014.

[Mendoza2009] Mendoza, T. V. Digital Inclusion of Indigenous People in Colombia, by the Digitalization and Safeguarding of Their Intangible Cultural Heritage. In Proceedings of the 3rd International Conference on Theory and Practice of Electronic Governance (pp. 407–408). New York, NY, USA: ACM, 2009.

[Ott2015] Ott, M., Dagnino, F. M., & Pozzi, F. Intangible Cultural Heritage: Towards collaborative planning of educational interventions. Computers in Human Behavior, 51(Part B), p. 1314–1319, 2015.

[Pietroni2013] Pietroni, E. (2013). Natural interaction in VR environments for cultural heritage: the virtual reconstruction of the Regolini-Galassi tomb in Cerveteri (with an Appendix by M. Sannibale and D. Pletinckx). Archeologia E Calcolatori, 24, 231–247. Retrieved March 7, 2018, from http://www.archcalc.cnr.it/indice/PDF24/11_Pietroni.pdf

[Protopapadakis2017] Protopapadakis, E., Voulodimos, A., Doulamis, A., & Camarinopoulos, S. (2017). A Study on the Use of Kinect Sensor in Traditional Folk Dances Recognition via Posture Analysis. In *Proceedings of the 10th International Conference on PErvasive Technologies Related to Assistive Environments* (pp. 305–310). New York, NY, USA: ACM. https://doi.org/10.1145/3056540.3076200

[Rodil&Rehm2015] Rodil, K., & Rehm, M. A Decade Later: Looking at the Past while Sketching the Future of ICH through the Tripartite Digitisation Model. Published in: International Journal of Intangible Heritage, 2015.

[Rodil2015] Rodil, K. Reflections on Visualization in Cross-Cultural Design. At the Intersections of Traditional and Indigenous Knowledges and Technology Design, 319–340, 2015.

[Rodil2011] Rodil, K., Eskildsen, S., & Rehm, M. Developing a visualized cultural knowledge transfer prototype: An in situ evaluation in Rural Namibia. 2011.

[Solanilla2008] Solanilla, L. The Internet as a Tool for Communicating Life Stories: a New Challenge for "Memory Institutions.", 2008.

[Styliaras2010] Styliaras, G., Koukopoulos, D., & Lazarinis, F. (2010). Handbook of Research on Technologies and Cultural Heritage: Applications and Environments. IGI Global. Retrieved October 6, 2017, from https://www.igiglobal.com/book/handbook-research-technologies-culturalheritage/41892

[Sutcliffe2000] Sutcliffe, A. G. & Kaur, K. D. Evaluating the usability of virtual reality user interfaces. Behaviour & Information Technology, 19(6):415–426, 2000.

[Turner2007] Turner, J., & Bidwell, N. J. (2007). Through the Looking Glass: Game Worlds As Representations and Views from Elsewhere. In Proceedings of the 4th Australasian Conference on Interactive Entertainment (p. 23:1–23:8). Melbourne, Australia, Australia: RMIT University. Retrieved March 7, 2018, from http://dl.acm.org/citation.cfm?id=1367956.1367979

[UNESCO2003] Intangible Heritage domains in the 2003 Convention. (n.d.).
Retrieved March 5, 2018, from https://ich.unesco.org/en/1com

[UNESCOethics] Ethics and Intangible Cultural Heritage - intangible heritage - Culture Sector - UNESCO.
(n.d.). Retrieved March 7, 2018, from https://ich.unesco.org/en/ethics-and-ich-00866

[Vrtk] VRTK - virtual reality toolkit. (n.d.). Retrieved March 15, 2018, from https://vrtoolkit.readme.io/

[Zaman2015] Zaman, T., Winschiers-Theophilus, H., Yeo, A. W., Ting, L. C., & Jengan, G. Reviving an Indigenous Rainforest Sign Language: Digital Oroo' Adventure Game. In Proceedings of the Seventh International Conference on Information and Communication Technologies and Development (p. 69:1–69:4). New York, NY, USA: ACM, 2015.